

Companies plan big boost
in R&D spending for 1980 Page 12

Chemical &
Engineering

NEWS

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Quarks, Forces, and Matter

On the verge of a unifying theory
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NEWS

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R&D support starts 1980's with strong year

Largest U.S. chemical firms plan 14% increase in R&D funding in 1980, comfortably ahead of R&D inflation rate; job outlook continues good

William F. Fallwell
C&EN, New York

Research and development in the U.S. basic chemical industry is getting off to a much different start in the 1980's than in the 1970's. In contrast to the growing wave of corporate skepticism and budgetary clamp-downs 10 years ago, R&D now enjoys its best level of boardroom appeal since the mid-1960's.

R&D budgets show it. C&EN's annual survey of R&D spending plans by the 17 largest basic chemical companies has turned up an overall estimated 14% gain in 1980 over 1979. Combined budgets this year will reach about \$1.89 billion for all 17 companies, compared to \$1.65 billion in 1979.

The 1979 figure is close to the initial estimate of \$1.62 billion in C&EN's survey a year ago (C&EN, Jan. 15, 1979, page 12). Spending in

1979 rose 12% from spending of \$1.48 billion in 1978.

These double-digit increases are welcome to the steadily increasing ranks of scientists and engineers in chemical R&D. Such increases are also necessary for increased staffs and projects in a time of double-digit inflation. Inflation in R&D trails the standard consumer price index of inflation but is still high. According to Dr. W. Halder Fisher of Battelle Columbus Laboratories, the U.S. industrial R&D inflation rate (the increase in cost per technical employee in R&D) rose to 7.6% in 1979 from 5.8% in 1978. In 1980, he predicts a jump to 10.7%.

However, chemical companies' R&D budgets are growing well above these inflation rates. That means companies will have another year of net increases to staffs and projects in 1980. In C&EN's employment outlook survey last fall (C&EN, Oct. 22, 1979, page 31), the expected increase in R&D staffs was 2% from mid-1979 to mid-1980, the same rate as in the previous 12 months.

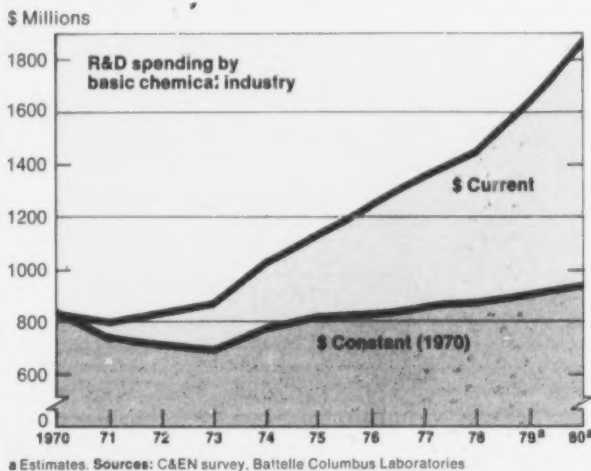
Although a 2% annual employment increase looks small, it actually translates into a strong job market. Hiring will be much higher than this, since some R&D staff people will retire, and many others will transfer to other parts of the company.

Similarly, the 14% budget increase (4% in constant dollars) that the current survey finds for R&D funding in 1980 is not meteoric. But like the job increase rate, the funding rate still means a vigorous time for R&D. The present funding rise is the seventh straight in constant dollars. Added up, this chain of increases has had a transforming effect. R&D budgets in 1980 will be double those of 1973 in current dollars and one third higher in constant dollars.

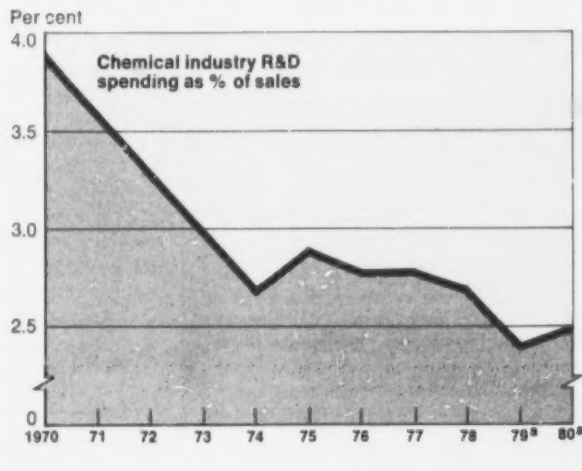
Even so, R&D funding has not kept up with the chemical sales pace. Combined R&D budgets as a percentage of sales in 1980 could inch up to 2.5% from 2.4% in 1979 if a mild U.S. recession touches the chemical industry. In 1979, the spurt in sales ran ahead of R&D funding, causing the drop to 2.4% from 2.7% in 1978.

R&D management tends not to place much weight on the R&D sales comparison in a year of high raw material inflation. Such inflation outpaces R&D inflation, leading naturally to a decline in R&D funding as a percentage of sales. The same thing happened in the wild commodity inflation of 1974, when R&D's percentage of sales dropped to 2.7% from 3.0% in 1973. However, as the 1975 recession cut deeply into the industry's financial performance, R&D rebounded to 2.9% of sales.

Chemical R&D spending in 1980 will stay well ahead of inflation in R&D costs . . .



. . . and may slightly exceed 1980 growth in basic chemical industry sales



Du Pont leads the field in R&D support with large increases in 1979 and 1980

\$ Millions	Worldwide R&D spending ^a								Change from previous year		R&D spending as % of sales	
	Planned 1980	Actual 1979	Planned 1979	1978	1977	1976	1975	1974	1980	1979	1979	1978
Air Products	\$ 27	24	23	23	24	19	16	11	13%	4%	2.0%	2.2%
Akzona	27	23	24	23	20	18	17	16	17	0	2.3	2.6
Allied Chemical	75	67	67	58	53	42	35	31	12	16	1.5	1.8
American Cyanamid	140	125	120	108	96	83	73	64	12	16	4.1	3.9
Celanese	100	91	93	83	77	70	64	58	10	10	2.9	3.2
Diamond Shamrock	50	42	40 ^b	36	29	24	20	14	19	17	1.8	2.0
Dow Chemical	310 ^b	270	265	232	203	188	167	149	15	16	2.9	3.4
Du Pont	490 ^b	425	403	377	367	353	336	344	15	13	3.4	3.6
Ethyl	na	na	na	25	28	25	19	25 ^c	na	na	na	1.8
W. R. Grace	44	40	41	41	34	30	30	32	10	-2	0.6	1.0
Hercules	53	46	45	40	37	35	30	30	15	15	1.9	2.1
Monsanto	195	160	160	144	132	114	116	87	22	11	2.6	2.9
Olin	na	na	26 ^b	25	25	25	24	19	na	na	na	1.6
Pennwalt	na	na	26 ^b	23	21	19	16	14	na	na	na	2.5
Rohm & Haas	62	54	55	49	45	43	45 ^c	39 ^c	15	10	3.4	3.9
Stauffer Chemical	45	38	39	34	33	29	24	20	18	12	2.5	2.6
Union Carbide	174	163	165	156	156	142	120	94	7	4	1.8	2.0
TOTAL^d	\$1792	\$1568	\$1540	\$1404	\$1305	\$1190	\$1093	\$989	—	—	2.4%	2.7%
ANNUAL CHANGE^d	14%	12%	10%	8%	10%	9%	11%	19%				

a Earliest company estimate. b C&EN estimate. c Includes activities later deleted. d For 14 companies with complete data for all years; per cent figures are averages. na = not available.

Despite its falling percentage of sales, R&D funding in the chemical industry is exhibiting a remarkable stability in another respect. For accounting purposes, R&D is a variable cost charged immediately to current revenue. This raises the temptation in hard times to trim R&D to increase earnings. Although there are still some signs of earnings-related fluctuations in some companies' R&D support, the industry as a whole has taken a successful stand against this practice.

A simple rundown of quarterly

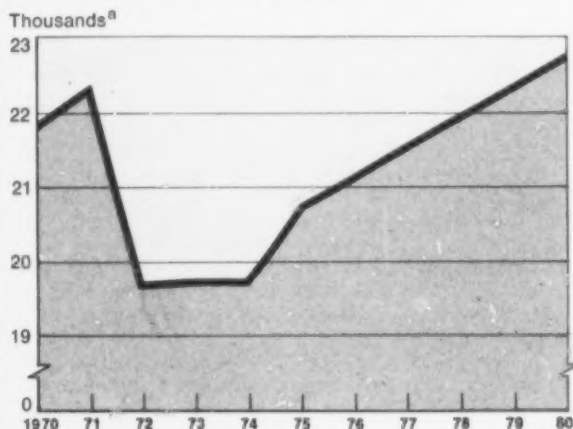
R&D outlays and corporate earnings shows R&D's newfound independence. For a group of six companies with such figures since the first quarter of 1976, R&D spending moved up steadily, climbing 39% by third-quarter 1979. Over the same period, earnings rose just 3% after negative gyrations during 1976, 1977, and 1978. These companies are American Cyanamid, Celanese, Diamond Shamrock, Dow Chemical, Monsanto, Stauffer Chemical, and Union Carbide.

In other words, R&D held up well

in the second half of the 1970's even though the chemical business as a whole had several tedious years under constant downward earnings pressure. Since the general outlook for the industry is brighter for the early 1980's, R&D may do even better.

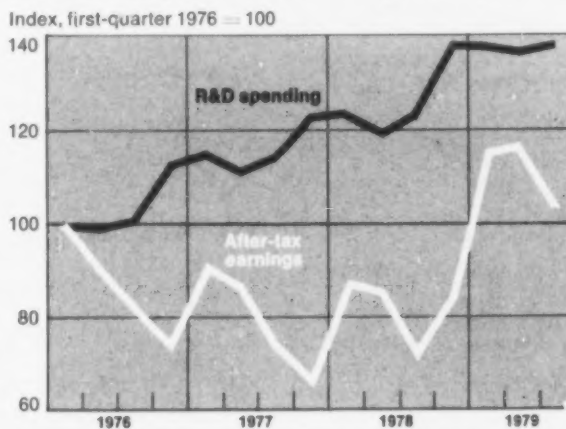
Some individual company moves support this possibility. Most important, Du Pont is again raising its R&D budget strongly after nearly a decade of restraint. From 1969 through 1978, Du Pont's R&D budget rose an average of only 3% per year, whereas the overall average annual

Employment continues to climb for chemical R&D scientists and engineers . . .



a Full-time equivalent R&D scientists and engineers in basic chemical industry at beginning of year. Sources: National Science Foundation, C&EN estimates.

. . . with steadily increasing budgetary support independent of earnings swings



Source: Combined data from American Cyanamid, Celanese, Diamond Shamrock, Dow Chemical, Monsanto, Stauffer Chemical, and Union Carbide

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increase in the chemical industry was 7%. Since Du Pont has by far the largest research establishment in the industry, performing about one fourth of all the industry's R&D, the company's pause for reshuffling in the 1970's was a significant drag on the industry's overall figures.

Du Pont appears now to be in a new R&D growth period. After a 13% budget increase in 1979 to about \$425 million, the company plans about a 15% increase in 1980. This works out to a budget of about \$490 million. In contrast to its drive to cut down pioneer projects earlier in the 1970's, Du Pont now shows some signs of a fresh initiative in basic research. One example is the molecular genetics (gene splicing) program the company started last year.

Besides Du Pont, another company that had a slow period in R&D growth in the late 1970's may be stepping up the pace. Union Carbide, after doubling its R&D funding from 1973 through 1977, tightened up in the next two years. The budget was flat in 1978 and grew only 4% in 1979. However, for 1980, the company plans a 7% increase to \$174 million.

By contrast, the other two companies in the industry's top four in R&D support, Dow Chemical and Monsanto, are pressing ahead with large, regular funding increases. Sol-

idly number two in the industry's R&D, Dow plans about a 15% budget increase in 1980 after 16% in 1979. This would bring the company's 1980 spending to \$310 million.

Monsanto plans the industry's largest percentage increase in funding in 1980 with a 22% gain to \$195 million. Now third largest in the industry's R&D funding, Monsanto plans increases in basic projects this year after doubling its budget since 1974.

As a result of the budget increases this year by the industry's top four in R&D, their share of the industry's total funding remains large, about 62%. Hence, R&D is still a concentrated activity, with proportionately more activity by the top four than their 55% share of sales among the 17 companies in C&EN's survey.

Still, many smaller companies plan sizable increases in R&D support in 1980 after strong gains in 1979. Increases amount to 12% in 1980 after 16% in 1979 at Allied Chemical (which is keeping an increased R&D emphasis and has instituted a scientific advisory committee whose chairman sits on the board of directors), 12% after 16% at American Cyanamid, 19% after 17% at Diamond Shamrock, 15% both years at Hercules, 15% after 10% at Rohm & Haas, and 18% after 12% at Stauffer Chemical. □

Companies blame U.S. for agent orange ills

Five chemical companies are not going to content themselves with merely being defendants against charges by a group of Vietnam veterans. The veterans say that the defoliant agent orange, which the companies supplied to the U.S. government, may have been the cause of birth defects and other maladies suffered by the veterans and their families.

The five companies—Dow Chemical, Monsanto, Hercules, Diamond Shamrock, and Thompson-Hayward, a subsidiary of North American Philips—have filed a third-party action against the federal government. The action alleges, in effect, that if any harm was done, it was the fault of the government and not of the companies that manufactured agent orange (C&EN, Jan. 14, page 13).

The action filed against the government in Federal District Court in Westbury, N.Y., accuses the government of negligent misuse of the chemical and also accuses the U.S. of failing to inform servicemen of the potential dangers associated with exposure to agent orange. The defoliant is a herbicide made of 2,4,5-trichlorophenoxy-acetic acid, and 2,4-

dichlorophenoxy-acetic acid. It also contained trace amounts of highly toxic dioxins.

The action brought by the chemical companies was in response to a class action suit brought against them last year by a Vietnam veterans' group on behalf of more than 3000 veterans.

The group is seeking the creation of a trust fund for the relief of victims of agent orange. The fund would be financed by the chemical companies and administered by the court.

Although the companies say they believe that the veterans' group has no case, the third-party complaints have been filed to protect them in case a jury determines liability.

The complaints were filed separately earlier this month, but they resemble one another on many counts. A company spokesman says that the firms are cooperating closely on the case. "Since we are being sued as a class, we are defending as a class," he says.

The chemical companies claim that they manufactured agent orange to government specifications and that they were required to supply it to the government under the Defense Production Act. They say that the gov-